

DRAFT

**A REPORT ON REGIONAL FLOODING
ISSUES AFFECTING
WASHOE COUNTY, NEVADA**

Prepared by:

**TRUCKEE RIVER FLOOD CONTROL PROJECT
NEEDS COMMITTEE**

On:

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VOLUME 1: REPORT

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LIST OF ABBREVIATIONS

CRS/CAV	Community Rating System / Community Assistance Visit
FCPNC	Flood Control Project Needs Committee
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
NDOT	Nevada Department of Transportation
PVC	Polyvinyl Chloride (pipe)
RCP	Reinforced Concrete Pipe
RR	Railroad
RTC	Regional Transportation Commission
SS	Sewer System
SSMH	Sewer System Manhole
TRFMA	Truckee River Flood Management Authority
WC	Washoe County

CHAPTER 1

BACKGROUND AND PURPOSE OF REPORT

1.1. FCPNC Background

The Truckee River Flood Control Project Needs Committee (FCPNC) was established in 2017 pursuant to Nevada Assembly Bill No. 375 (AB 375) and Resolution 2017-8 (passed by the Truckee River Flood Management Authority Board of Directors). For reference, the full text of AB 375 is included in *Appendix A* of this report.

The main purpose of the FCPNC was to recommend the imposition of one or more tax(es), fee(s), rate(s) or charge(s) to fund the construction of an approved flood control project. The work of the committee has been focused on the following tasks:

- Before April 2, 2018, the FCPNC will prepare recommendations regarding taxes, fees, rates or any combination thereof to provide funding to the flood management authority for an approved flood management project.
- Additionally, the FCPNC will have 18 months to investigate, prepare and submit a report concerning the issue of flooding in areas of the county that are not covered by a flood protection plan.

Appointed members of the FCPNC included representatives from these organizations and entities:

- Governor's Office
- Nevada State Senate
- Nevada State Assembly
- Nevada Association of Realtors
- Retail Association of Nevada
- City of Reno
- City of Sparks
- Washoe County
- EDAWN
- Resort Association
- Chamber of Commerce
- BANN
- NV AFL-CIO
- NAIOP
- RTAA
- TRFMA

The FCPNC held a series of meetings and ultimately voted to recommend that the Washoe County Board of County Commissioners submit a question to the voters of Washoe County seeking approval of an increase of the property tax in the amount of \$0.0248 per \$100 of assessed valuation. The ballot measure was rejected by the voters of Washoe County at the General Election held on November 6, 2018.

The FCPNC met several times thereafter to investigate, prepare and submit a report on regional flooding issues per the requirements of AB 375. This report effectively concludes the work of the FCPNC.

1.2. Description of Known Regional Flooding Issues (not including Truckee River)

Generally the local history of flooding general to Washoe County, Nevada has been limited to overflows from the Truckee River. The sinuous and meandering condition of the original Truckee River bed and banks as discovered by the early pioneers led to a naturally occurring flood swollen area that covers a significant portion the area in Washoe County known as the Truckee Meadows. This flooded area provides natural attenuation of storm flows for the properties downstream in the Lower Truckee Canyon, parts of Wadsworth, Nevada and tribal property located near Nixon, Nevada and Pyramid Lake.

Other much more localized drainage conditions have surfaced over time as development spread throughout the county. As developments have matured and development methods improved a majority of the drainage problems have remained minor in significance and localized without much regional impact with certain exceptions.

The two major exceptions may be found in drainage related issues pertinent to the closed watershed basins located in northern Washoe County and to those properties that lie adjacent and nearby the various irrigation ditches that have pulled water from the Truckee River at various points from the City of Reno jurisdiction to points upstream.

North Valleys

The closed basins describe a number of small drainage watersheds that all convey excess storm water to what are normally dry lake beds located within each basin. Most have single basin sinks, some have overflows to a second basin but the similarity is that once stormwater has found it's lowest point there is no riverine outlet. The basins are all relatively small and therefore do not generally accumulate enough water to maintain perennially filled lakes; since the lakes that form are typically shallow they generally dry up from one year to the next due to evaporation. Another similarity is that the lake bottoms consist of fine materials that have accumulated over the millennia which makes infiltration of lake water poor or non-existent.

When development began significantly in this area in the early 80's, our local jurisdictions nor even FEMA had any guidelines established as to how maximum water surface elevations (WSE) for these annual lakes might be determined. So when development permits were submitted WSE approximations were completed and permits granted.

The water year of 2017 exposed some of the lower home and building sites to significant flooding. That year, became the highest accumulation of annual precipitation of record for the region. What further exacerbated the flooding problem is that the flooding did not recede as with typical riverine flooding after a week or two after the rains stopped but has carried over due to the sheer volume of runoff past 2018 and beyond. The proposals to solve to these problems are numerous and extremely complex and very expensive. To date, none of these proposals have been agreed to by those being impacted, the engineering community or government.

Irrigation Ditches

The second exception noted is for the irrigation ditches. The problem with the irrigation ditches is that historically they were laid out with very mild slopes in order to extend conveyance of irrigation water to the maximum amount of farm and ranch land property in the Truckee Meadows. In the process they traverse all of the secondary naturally existing drainage channels (and creeks) in the Truckee Meadows and in process intercept a significant amount of that naturally occurring runoff. Since they are of mild slopes they can only convey small volumes of water (sufficient for irrigating fields) not sufficient to convey the large amount of storm water that gets into them. What transpires is that the overall local runoff conveyance pattern has been altered significantly with the increased potential for overflows of the ditches to occur and even more damaging breaches of the ditch embankments to occur.

What compounds these problems is that development has occurred all around these ditches. This makes reworking the channels difficult and expensive. Another problem is that although the ditches typically shut down operation in the winter when irrigation water is not in demand, they have diverted water away from some watersheds and moved it to others. Therefore in some of the historic districts especially in Reno, the surface and subsurface drainage systems developed were sized for what was observed and not what actually historically should be there. This has the effect of undersizing drainage facilities and increasing the cost to an ultimate solution.

1.3. Existing Flood Management Plans that Address Regional Flooding Issues

This report on regional flooding issues was compiled using the most recent available information provided by public works officials representing the City of Reno, the City of Sparks and Washoe County. The following existing flood management plans were also reviewed prior to preparation of this report:

- City of Reno and Washoe County TMSA/FSA Water, Wastewater, and Flood Management Facility Plan, Volumes 1 and 2 (November 2007)
- Sparks Basin Stormwater Master Plan Phases I – III: Areas 1 through 11 (December 2011)

For reference, all or pertinent portions of these plans have been included in the report appendices.

1.4. Purpose of Report

Pursuant to the requirements of AB 375, the main purpose of this report is to briefly describe ongoing efforts to address known regional flooding issues within the City of Reno, City of Sparks, and Washoe County that are **not** included in the Truckee River flood control plan being developed by the Truckee River Flood Management Authority (TRFMA). The TRFMA plan is a separate effort by the local governments to address longstanding flooding issues along the Truckee River mainstem.

CHAPTER 2

PROPOSED PROJECTS TO ADDRESS REGIONAL FLOODING ISSUES

The cities of Reno and Sparks and Washoe County were asked to provide a list of proposed capital improvement projects that would help address known flooding issues (other than Truckee River flooding issues) within each jurisdiction.

Table 2.1, Table 2.2, and Table 2.3 provide a summary of flood control and drainage improvement projects currently contemplated by Reno, Sparks and Washoe County, respectively. Some of these projects are slated for construction within the next 5 years; others are in preliminary planning stages with no set date (or funding) for implementation.

Table 2.1
City of Reno’s Regional Drainage Improvement Needs
(Beyond TRFMA Flood Project Elements)

Project Name	Project Description	Estimated Cost (construction only)	Priority Ranking	Fiscal Year*
City of Reno Drainage Master Planning	Phased master plan of City of Reno storm drain systems: evaluates remaining storm drain capacities of existing facilities and prioritizes drainage improvement projects.	\$2,500,000	1	2020
Margrave Ditch erosion (by Reno Costco)	Address erosion and property loss.	\$1,000,000	1	2020
Matley Ln & Terminal Wy	Storm drain and catch basins.	\$500,000	1	2020
Dry Creek Repairs at Reno-Tahoe International Airport (City of Reno portions)	The Dry Creek channel segment just north of the E. Peckham Ln crossing has eroded the east and west channel banks, causing property damage and channel migration. Design repairs at Dry Creek channel within City of Reno Maintenance easement at Reno-Tahoe International Airport.	\$400,000	1	2020
Truckee River Whitewater Park Repair Work	Repair undermined grouted riprap in whitewater park.	\$250,000	1	2020
Warren Estates Evaluation & Drainage Improvement Project	Drainage improvements in the Longwood/Hedgewood roads; new storm drain.	\$3,200,000	Ongoing	2021
Rosewood Wash Culvert Upgrades	Storm drain improvements and Flood Insurance Map revisions to reflect revised floodplain.	\$2,500,000	1	2021
Stead at Silver Lake Rd	Upsize culvert across Silver Lake Rd at RR from 24" PVC to large diameter RCB	\$600,000	1	2021

Project Name	Project Description	Estimated Cost (construction only)	Priority Ranking	Fiscal Year*
Autumn Hills, Offenhauser, Longley & McCarran storm drain Improvements and Detention Solutions	Storm drain upsizing; possible detention.	\$10,000,000	1	2022
Sagittarius Storm Drain Improvements	Storm drain construction/ditch relief.	\$6,000,000	1	2022
Miscellaneous Various Storm Drain: Greenridge to Moore, various "island 18", Edison Wy, Sage St yard area, California Ave, Isbell Rd, Avenida de Landa, Wedekind, Scottsdale/Clear Acre	Replace/upgrade storm drain pipe.	\$2,500,000	1	2022
Double Diamond Levee Upgrades	Construct levee improvements at Double R Blvd and Double Diamond Blvd to provide FEMA certified flood protection.	\$1,000,000	1	2022
Belford Drainage overpass at Lake Ditch	Provide overpass/bypass such that the Belford Drainage flows will continue down the drainageway and not be intercepted by the Lake Ditch.	\$800,000	1	2022
In and Out Basins: 12th and Brookfield, 12th and Washington, Plumas & Hillcrest	Remove in and out basins and tie to storm drain.	\$500,000	1	2022
Miscellaneous Grading-Reggrading: Len Cir, Orange and Apple St, Hatch, Brentwood, Walker, Skyline	Grading / Reggrading curb and gutter, ponding issues	\$500,000	1	2022
Sadleir Southworth (Wells Ave) Area Storm Drain Improvements	Upgrade/enlarge or provide surcharge relief system for storm drain system.	\$350,000	1	2022
Silver Lake Apartments (City right of way)	Construct sediment basin: high sediment loads at this location.	\$100,000	1	2022
Irrigation Ditch Tributary Crossing Improvements	Improve the ditch crossings at three irrigation ditches to reduce ditch failures and overtoppings.	\$15,000,000	NR	2022
Stead Storm Drain and channel improvements	Storm drain construction and channel improvements.	\$7,000,000	2	2023+
Aquila Ave/Krupp Cir Drainage Improvements	Enlarge and reinforce roadside ditches, upsize/install new storm drain.	\$6,500,000	2	2023+
Thomas Creek at South Virginia St between approximately Patriot & Gavian storm drain improvements.	Improve storm drainage across roadways in this area.	\$5,000,000	2	2023+

Project Name	Project Description	Estimated Cost (construction only)	Priority Ranking	Fiscal Year*
7495 South Virginia near Huffaker School	Repair/replace section of system in the center of South Virginia.	\$300,000	2	2023+
Lemmon Dr near intersection of Military Rd	Stabilize and regrade 800 feet of roadside ditch on west side of Lemmon Dr.	?	2	2023+
Detention Basins: Thomas Creek at Zolezzi Detention Basin, Evans Creek at Ballardini Ranch, Evans Creek, Dry Creek @ Huffaker	Regional detention opportunities.	\$20,900,000	3	2023+
Galena Narrows Detention Basin	Detention at Galena Narrows.	\$2,000,000	3	2023+
Whites Creek at Thomas Rd Detention Basin	Detention at Whites Creek.	\$1,800,000	3	2023+
Vine St Culvert Upgrades	Install parallel 66" and 72" RCP storm drain.	\$1,800,000	3	2023+
Thomas Creek at Ventana Pkwy	Detention at Ventana Pkwy.	\$1,750,000	3	2023+
Evans Creek Block "N" storm drain Improvements at I-80 to River	Triple 7' x 5' RCB.	\$1,750,000	3	2023+
Manzanita Park Wash (With Excavation)	Detention basin in Dry Creek/Boynton watershed. (BCA Ratio 1.82)	\$1,500,000	3	2023+
Whites Creek Flow Split	Construct flow split.	\$430,000	3	2023+
Edison Wy Area	Storm drain and roadside ditch improvements	\$400,000	3	2023+
Horse Creek Channel Improvements Military Rd to Lear	Channel improvements from Military Road to Lear Blvd to stabilize low flow channel and pyramat lining.	\$350,000	3	2023+
East Fork Chalk Creek at Sapphire Ridge Development	Address erosion through channel improvements.	\$100,000	3	2023+
Yori Park Retention Basin	Improve retention basin.	\$50,000	3	2023+
Thomas Creek: Structures, Culverts, Flow Splits, Irrigation Ditch Bypass Structures	Channelization/storm drain project to direct flows (alluvial fan characteristics).	\$10,000,000	NR	2023+
Dant Wash: Culverts	Eastshore Dr 3-10'x4', Brinkby Ave to Eastshore, 5x3' box, Moana private driveway.	\$8,600,000	NR	2023+
Boynton Slough: Culverts		\$8,600,000	NR	2023+
Galena Wash: Channel/Culverts	Between Wedge Pkwy – 36 inch CMP, Galena High and Wedge Pkwy (older study – still applies?).	\$6,450,000	NR	2023+

Project Name	Project Description	Estimated Cost (construction only)	Priority Ranking	Fiscal Year*
Virginia Foothill Wash: Channel, Culverts and Debris Basins	Mira Loma Rd - Steamboat Creek. T5', D2', Rancho Verde Dr, debris basin site.	\$5,800,000	NR	2023+
Swan Lake/Silver Lake Flooding: Partial Solutions	Creating flood volume mitigation.	\$5,000,000	NR	2023+
Black Springs Wash: Culvert and Channel work	Leather Ln, Cassilis Dr, Silver Lake Rd box, Old 395.	\$2,600,000	NR	2023+
Black Springs Wash: Channel and Culverts	Tholl Dr-Military Rd, Wise Ave, Leather Ln.	\$2,500,000	NR	2023+
Paymaster Wash: Channel	US 395 Silver Lake Rd: 2 12'x3', upsize existing 36" US 395.	\$2,500,000	NR	2023+
Anderson Wash: Culvert	US 395. 4'	\$2,000,000	NR	2023+
Alum Creek: Channel and Ditch Modification	500' U/S of McCarran - Mayberry Dr T50', B25', D5'; ditch or natural channel, Last Chance Ditch west of West McCarran.	\$1,750,000	NR	2023+
Evans Creek-Modify Head Gates, Channel Improvements and Structures	East McCarran 7-12'x10', Longley Ln 7-12'x10', airport runway 34R 5-12'x10', Peckham Ln 4-12'x10.	\$1,650,000	NR	2023+
Lemmon Valley Wash: Culvert		\$1,200,000	NR	2023+
Rosewood Wash (Phase 2): Discharge Structures, Channel Improvements, Culverts	Last Chance Ditch between Barnes and Belford, Corey Dr and Rainna, enlarge channel from 1000' upstream of Arlington to Arlington Ave.	\$1,000,000	NR	2023+
Aspen Glen Dr and White Fir St or Ambrose Park: Structure	Intake restriction structure of excess flow discharge.	\$275,000	NR	2023+
Dandini Wash: Structure	E of Valley Rd, N of Manogue High School (need to confirm).	\$170,000	NR	2023+
Total Estimated Cost – All Reno		\$159,425,000		

*Fiscal Year is the planned year of construction

NR = Not Ranked

Source: This table was prepared using information provided by the City of Reno's Draft Five Year Capital Improvement Plan 2018/19 - 2022/23.

Table 2.2
City of Sparks' Regional Drainage Improvement Needs
(Beyond TRFMA Flood Project Elements)

Project Name	Project Description	Estimated Cost	Fiscal Year*
19-6600 East Prater Wy Storm Drain Project: Construction	Storm drainage improvements to 19th St in the area of J Stt to Brunetti Wy.	\$2,305,000	2019
19-6601 Rockwood Dr & Glen Meadow Dr SD Improvements: Design	Storm drainage improvements to existing ditch piping adjacent to Pyramid Wy south of Greenbrae Dr.	\$200,000	2019
19-6601 North Truckee Drain Lillard Box: Engineering & ROW	Storm drainage improvements to Rock Blvd between Greg St and Glendale Ave.	\$350,000	2021
19-6601 North Truckee Drain Lillard Box: Construction	Storm drainage improvements to Rock Blvd between Greg St and Glendale Ave.	\$2,650,000	2022
19-6694 North Truckee Drain Annual Cleaning	Annual cleaning program for North Truckee Drain, approximately 3,000 linear feet per year. Generally located I-80 to Vintage Hills Pkwy.	\$750,000 (\$150,000/year)	2019 - 2023
19-6690 Annual Storm Drain Street Improvement Coordination	<p>These appropriations are for sewer infrastructure rehabilitations in support of annual RTC Regional Road Projects. This may include removal and replacement /lining/bursting of SS main/laterals, SSMHs, and SSMH Lids.</p> <p>These appropriations are for sanitary sewer infrastructure rehabilitations in support of annual Sparks Road Ahead Projects. This may include removal and replacement /lining/bursting of SS main/laterals, SSMHs, and SSMH Lids.</p> <p>Storm drain facility repair and replacement will be coordinated with roadways slated for preventative, rehabilitation, and replacement efforts by City of Sparks, RTC, and/or NDOT.</p>	\$1,375,000 (\$275,000/year)	2019 - 2023
19-6691 Annual Storm Drain System Dam, Ditch, Flood and Drainage Structures	<p>Appropriations for this project will allow for storm drain, ditch, and channel infrastructure rehabilitation and replacements as needed and/or identified as part of the utility assessment condition program. Coordination with selected Rehab/Recon Road Work Projects as scheduled for future years shall be considered.</p> <p>Potential projects include open ditch piping improvements, North Truckee Ditch drainage improvements, Stanford Wy storm drain rerouting, and other improvements as needed.</p> <p>These funds will be set aside each year to be available to address new construction or repairs beyond the typical maintenance for the City's dams, flood structures, or possible City-wide flood protection construction or rehabilitation projects. Projects/Materials identified to use this funding will require approval by the Public Works Director and/or the City Council as necessary.</p>	\$1,000,000 (\$200,000/year)	2019-2023

Project Name	Project Description	Estimated Cost	Fiscal Year*
19-6692 Annual Curb, Gutter, and Sidewalk Projects	Annual funding used to replace aged curb, gutter and drainage inlets throughout the City. Locations are based on priorities of pavement management team to coincide with planned roadway preventative maintenance/rehabilitations projects.	\$3,250,000 (\$650,000/year)	2019 - 2023
19-6693 FEMA CRS/CAV	This project is required to develop mitigation plans in response to the requirements of the City's FEMA CRS/CAV and maintain the City's rating with FEMA. This funding will also be used for issues that arise through FEMA FIRM mapping and actions to correct inconsistencies.	\$250,000 (\$50,000/year)	2019 - 2023
19-6695 Storm Drain Outreach Maintenance Program	Funding to provide outreach materials to affect and improve stormwater quality. Could include items such as fliers, hiring of temporary help for maintenance of dog-poop bag stations and informational signage.	\$75,000 (\$15,000/year)	2019 - 2023
19-6696 Annual Contingency for Emergencies	<p>These funds will be set aside each year to be available to address emergencies in our storm drain system or contingencies that were not anticipated. The following examples of projects that might be approved for this funding source:</p> <ol style="list-style-type: none"> 1. Projects to correct a blockage that has occurred or is imminent. 2. Correct a line failure which has occurred or is imminent and poses a significant hazard. 3. Projects identified during/after an emergency operation such as flooding or other natural disaster. 4. Projects where grant money becomes available to cover part of the overall cost. 5. Projects that have the opportunity to enter into a cost sharing agreement with another agency. 6. Significant operational savings can be achieved immediately if the project/materials is completed or bought now. 7. An unplanned road/utility project is started where we want to completed work on underground utilities. 8. New projects of higher priority as deemed by the City Manager or City Council. <p>Projects/Materials identified to use this funding will require approval by the Public Works Director and/or the City Council as necessary.</p>	\$500,000 (\$100,000/year)	2019 - 2023
Total Estimated Cost – All Sparks FY 2019 - 2023 (5 years)		\$12,705,000	

*Fiscal Year is the planned year of construction

Source: This table was prepared using information from the City of Sparks' Five Year Capital Improvement Plan 2018/19 - 2022/23.

Note: Recurring annual cost estimates were combined to develop a total cost estimate for all proposed projects/work over the 5-year period.

Table 2.3
Washoe County's Regional Drainage Improvement Needs
(Beyond TRFMA Flood Project Elements)

Project Name	Project Description	Estimated Cost	Fiscal Year*
Rhodes Rd (Steamboat Creek Watershed)	Culvert	\$4,700,000	Unknown
<i>Subtotal WC – South Truckee Meadows</i>		<i>\$4,700,000</i>	
Village Pkwy at Mud Springs Dr	Culvert	\$3,550,000	Unknown
Nine Mile Ct	Debris Basin	\$18,620,000	Unknown
Cold Springs Dr Channel	Channel	\$550,000	Unknown
Little Valley Dr	Culvert	\$470,000	Unknown
Cold Springs Dr Culvert	Culvert	\$470,000	Unknown
Cold Springs Dr to Village Pkwy	Channel	\$6,220,000	Unknown
Village Pkwy	Culvert	\$1,670,000	Unknown
<i>Subtotal WC – Cold Springs</i>		<i>\$31,550,000</i>	
Whites Creek at Zolezzi Ln	Culvert	\$720,000	Unknown
Bailey Creek at Toll Rd (Steamboat Creek)	Channel	\$2,750,000	Unknown
Bailey Creek at Toll Rd	Culvert	\$780,000	Unknown
Jones Creek at Mt. Meadow Ln Area	Culvert	\$1,090,000	Unknown
Jones Creek at Callahan Ranch Rd	Culvert	\$1,330,000	Unknown
Galena Creek Narrows	Detention Basin	\$14,370,000	Unknown
Bailey Creek at Kivett Ln & Toll Rd	Channel	\$9,990,000	Unknown
Geiger Fork of Bailey Creek at Kivett Ln (Channel)	Channel	\$860,000	Unknown
Geiger Fork of Bailey Creek at Kivett Ln (Culvert)	Culvert	\$290,000	Unknown
Geiger Fork of Bailey Ck at Pinion Dr & Kivett Ln	Channel	\$550,000	Unknown
Geiger Fork of Bailey Creek at Pinion Drive	Culvert	\$290,000	Unknown
Geiger Fork of Bailey Creek at SR 341 & Pinion Dr	Channel	\$2,240,000	Unknown
Geiger Fork of Bailey Creek at SR 341	Culvert	\$340,000	Unknown
Geiger Fork of Bailey Creek at Pinion Dr (Bridge/Culvert)	Bridge/Culvert	\$340,000	Unknown
Bailey Creek at Temple Hill Rd & Kivett Ln	Channel	\$2,160,000	Unknown
Bailey Creek at Toll Rd & Temple Hill Rd	Channel	\$2,010,000	Unknown
Bailey Creek at Temple Hill Rd	Culvert	\$150,000	Unknown
Bailey Creek at Private Driveway	Culvert	\$150,000	Unknown
Bailey Creek at Toll Rd	Culvert	\$150,000	Unknown
Bailey Creek – Dam Site at Toll Rd	Channel	\$1,650,000	Unknown
Bailey Creek – Dam Site	Detention Basin	\$30,750,000	Unknown
<i>Subtotal WC South Truckee Meadows</i>		<i>\$72,960,000</i>	
Antelope Valley Wash	Debris Basin	\$18,450,000	Unknown
Chickadee Wash at Lemmon Dr	Culvert	\$2,500,000	Unknown
Arkansas Street Wash at Lemmon Dr	Culvert	\$920,000	Unknown
Closed basins at various locations	Closed Basin Flood	\$50,000,000	Unknown
<i>Subtotal WC – Stead/Lemmon Valley</i>		<i>\$71,870,000</i>	

Project Name	Project Description	Estimated Cost	Fiscal Year*
Sun Valley Wash #1	Culvert	\$510,000	Unknown
Sun Valley Wash #2	Culvert	\$510,000	Unknown
Sun Valley Wash at Sun Valley Dr	Channel	\$510,000	Unknown
Sun Valley Wash #3	Culvert	\$590,000	Unknown
Sun Valley Wash #4	Culvert	\$510,000	Unknown
Sun Valley Wash #4	Channel System	\$6,110,000	Unknown
Sun Valley Wash at 9 th Ave	Culvert	\$510,000	Unknown
Sun Valley Wash #5	Culvert	\$780,000	Unknown
Sun Valley Wash at 8 th St & Leon	Channel	\$850,000	Unknown
Sun Valley Wash at Pit Ln & Side Hill Dr	Channel	\$2,640,000	Unknown
Sun Valley Wash at Leon St & First Ave	Channel System	\$2,770,000	Unknown
Sun Valley Wash #6	Culvert	\$950,000	Unknown
Sun Valley Wash #7	Culvert	\$1,020,000	Unknown
Sun Valley Wash #8	Culvert	\$1,710,000	Unknown
Sun Valley Wash #10	Channel	\$1,650,000	Unknown
<i>Subtotal WC – Sun Valley</i>		<i>\$21,620,000</i>	
Dog Valley Creek 800FT UPST of Bridge St	Channel	\$2,350,000	Unknown
Dog Valley Creek at Bridge St	Bridge	\$1,290,000	Unknown
Dog Valley Creek (Bridge St – Truckee River)	Channel	\$1,210,000	Unknown
North Flat Wash (Old Hwy 40 – Truckee River)	Channel	\$1,020,000	Unknown
Dry Creek at Panorama Dr	Culvert	\$1,860,000	Unknown
Dry Creek at Frost Ln	Culvert	\$550,000	Unknown
Dry Creek at Dieringer Dr	Culvert	\$1,460,000	Unknown
Dry Creek at Lakeside Dr	Culvert	\$1,120,000	Unknown
Dry Creek at Timothy Dr	Culvert	\$1,210,000	Unknown
Dry Creek at Holcomb Ln	Culvert	\$1,020,000	Unknown
North Hidden Valley Wash Dam Site	Detention Basin	\$9,640,000	Unknown
South Hidden Valley Wash Dam Site	Detention Basin	\$3,440,000	Unknown
South Hidden Valley Wash Irrigation Ditch	Ditch/Tributary Crossing Improvements	\$5,000,000	Unknown
<i>Subtotal WC – Truckee Meadows</i>		<i>\$31,170,000</i>	
Total Estimated Construction Cost – All WC		\$248,470,000	

*Fiscal Year is the planned year of construction

Source: This table was prepared using information from Table 14.1 (modified) of the City of Reno and Washoe County TMSA/FSA Water, Wastewater, and Flood Management Facility Plan (November 2007).

Note: The original 2007 construction cost estimates were updated to 2019 levels (3.5% inflation) and include a 40% contingency. No design, project management, or inspection costs are included. Potential needs identified should not be considered approved projects; further evaluation and analysis is required to determine viability, cost effectiveness and potential sources of funding for implementation.

CHAPTER 3

RECOMMENDATIONS

3.1. Recommendations for Additional Flood Protection or Mitigation Measures

At this time, the Truckee River Flood Control Project Needs Committee (FCPNC) has no recommendations for additional flood protection or mitigation measures to address regional flooding issues.

3.2. Recommendations on Issues That Need Further Study and Modeling

The projects listed in the accompanying table are largely known by observation only. Few, if any of these projects have been through preliminary engineering design which would identify value specific improvements to the proposed solutions as contained with the table and accurate cost estimates of the actual projects. It is common among all municipal governments that improvements to the drainage and flood related infrastructure comes after the water and wastewater infrastructure have been improved and stabilized throughout the communities. Funding for these drainage projects has not been made readily available by the federal and most state governments and so construction of the flood control projects have lagged behind. Only those projects that have a substantial detriment to the community have been addressed and for obvious reasons.

The City of Sparks has begun addressing some of its problems through a city wide flood fee, and through this, the North Truckee Drain Relocation Project has been delivered. The City of Reno is currently considering a drainage utility fee to generate funding to accomplish a significant portion of the projects as listed in the table. Washoe County currently is charging citizens living north of Sparks a drainage fee, but it is not sufficient for county wide application.

Prior to recommending which project should receive further study, the FCPNC recommends that each of these projects be compared and prioritized based on engineering feasibility, cost and benefits provided before a list can be developed of the most likely projects to receive further consideration and perhaps further study. The scope of this report does not extend far enough to make this determination, but it does list the projects and known problems as a beginning to this ultimate process.